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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/662,145

09/15/2003

His Majesty Bhumibol Adulyadej

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04/16/2010

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EXAMINER

HOGAN, JAMES SEAN

ART UNIT

PAPER NUMBER

3752

MAIL DATE

DELIVERY MODE

04/16/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/662,145

Applicant(s)

BHUMIBOL ADULYADEJ, HIS
MAJESTY

Examiner

JAMES S. HOGAN

Art Unit

3752

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 11, 13, 14, 16, 18 and 20-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 11, 13, 14, 16, 18 and 20-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed November 30, 2009 have been fully considered but they are not persuasive.
2. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). The combination of the various arts below show differing approaches and obvious motivation for the use of various chemicals at various states of cloud conditions for their use at various desired levels, and has been shown in previous actions that the result of either desired precipitation or the prevention of hail conforms to the instant claims
3. Further, it is not contested that the claimed methodology in part borrows from the use of known chemicals, each attempt in every step of the multi-part methodology has its roots in each of the cited arts, as the use of a known chemicals under desirable conditions, will produce a known result. Stacking the use of the chemicals in the order cited provides a path where one having ordinary skill in the art could reference the prior arts as though following directions in a recipe: That is, if one was to, for example, as per claim 1, wish to "Trigger" active cloud formation from an atmosphere having no less

than 60% relative humidity, by dispensing cloud condensation nuclei (CCN) of at least one hygroscopic chemicals, it would be reasonable to investigate what constitutes a cloud condensation nuclei, where Dennis would show that NaCl particles, a known hygroscopic, are tested for the formation of cloud droplets by sprinkling particles over a cloud formation. This arguably provides a first step in piecing together the claimed invention. Rottner's full teaching of aerial dispensing of chemicals completes the teaching of the first part of the "Triggering" step, since an airplane would most certainly be needed for the dispensing parts of the methodology. Even though Rottner says it may not be common in operational cloud seeding operations, it is not impossible to do so, and thus entirely plausible in its attempt.

4. As for "Fattening", the use of Nelson as a modifying art is valid for the teaching that exothermic-hygroscopics is also known, regardless of any issues that it presents to Nelson at the time of their invention, with Rottner's aerial motivation.

5. The argument that simultaneous seeding by Montmory is not inherently taught for "Attacking" is moot. Montmory teaches "using known techniques" of dispensing from the ground or from aerial devices. Nothing prohibits a user from doing so at the same time, as Applicant argues, thus creating a "Sandwich" technique. As "salts" are part of what makes up encapsulated seeding, Montmory indeed teaches their possible individual use, regardless of circumstances.

6. "Enhancing", the use of super-cooled chemicals below cloud level is still relevant with the teachings of Rottner, as it has been explained below.

7. Summarily, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 11, 18 and 20-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dennis, in view of Rottner et al and further in view of U.S. Patent No. 3,659,785 to Nelson et al, and even further in view of U.S. Patent No. 4,362,271 to Montmory.

Claims 1, 11 and 27 claim a process of rainmaking comprising the steps of triggering, fattening, attacking and enhancing.

As per claims 1, 11, and 27, Dennis teaches (pages 35-38, especially Fig. 3.4) the evidence of hygroscopic particles (NaCl, as per claims 21 and 22) for the intended purpose of "Triggering" cloud condensation nuclei formation, where NaCl particles are tested for the growth of cloud droplets. Dennis does not teach aircraft dispersion of such particles. Rottner et al teaches cloud "enhancement" by the dispersion of hygroscopic materials from an aircraft at an optimal time (presuming favorable

conditions (i.e. relative humidity over 60%) (See Rottner et al; 5.2.1.4, page 92)), however conceding that to do so would take massive quantities of the particles to do so.

As for "Fattening", the teaching of Nelson's use of hygroscopic materials lends motivation for the use of exothermic-hygroscopic chemical, in that Nelson et al teaches it to be known to use calcium chloride (as per claims 21 and 23). This teaching (Col. 2, lines 56-65) further teaches using encapsulated particles of cloud seeding chemicals (urea used) for a desired range for the size of droplets, thus teaching the increase of a low to high range as "fattening" with a known exothermic hygroscopic chemical. Combined with the aircraft dispersion techniques of Rottner et al, which would include dispersing into an updraft portion of the cloud, "Fattening" would be a sub-technique to the Triggering" teaching of Dennis in view of Rottner et al.

As for "Attacking", Montmory discloses the use of a device, as described in column 4, lines 32-59, and Col. 4, lines 51-60 where "salts" are sprayed into and at the base of clouds from an aircraft. Montmory teaches the dispersion of known cloud-seeding chemicals (Col. 3, Lines 30-40) in an atmosphere "likely to give rise to precipitations" and although further teaches the performance of the known chemicals "once the relative humidity exceeds 40 to 50 percent. By assuming the positive benefits of using the chemicals as described in Triggering and Fattening (as per claims 24 and 25, as urea is taught by Nelson et al), the Attacking portion of the claimed methods is thereby consolidated using the technique of Montmory.

As for 'Enhancing' Rottner et al further teaches optimum aircraft dispersal techniques which lend teaching to the techniques of "Enhancing", where Rottner et al

teaches supercooled chemicals (dry ice , as per claim 26) being dispersed ‘usually above cloud level”, leaving a variable teaching of dispersing at other levels, especially if the cloud is shallow (see page 96). Combining with a “Triggered” and “Fattened” cloud would then leave the basis for experimentation where additional known chemicals fed into a process already begun (Triggering, Fattening and Attacking) would benefit the process. Summarily it would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined the known weather modifying techniques and teachings of Dennis, Rottner et al, Nelson et al and Montmory in any prescribed order or by alternating (as per claim 20) order to promote the initiation of a desired weather event, to any desired land mass, including that of between hills and mountains as obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

As per claim 18, Montmory discloses the use of a device, as described in column 4, lines 32-59, and Col. 4, lines 51-60 where “salts” are sprayed into and at the base of clouds from an aircraft (as per claim 17). Montmory teaches the dispersion of known cloud-seeding chemicals (Col. 3, Lines 30-40) in an atmosphere “likely to give rise to precipitations” and although further teaches the performance of the known chemicals “once the relative humidity exceeds 40 to 50 percent. By assuming the positive benefits

of using the chemicals as described in Triggering and Fattening (as per claims 24 and 25, as urea is taught by Nelson et al), the Attacking portion of the claimed methods is thereby consolidated using the technique of Montmory, and as Montmory teaches the desire to prevent hail during the process of initiating rainfall, it would have been obvious to one skilled in the art at the time the invention was made to have simultaneously combined the known cloud seeding techniques, in any sequence of Dennis, Montmory Nelson et al to insure the eruption of rain or to prevent hail.

Claims 13, 14, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dennis, in view of Rottner et al and further in view of U.S. Patent No. 3,659,785 to Nelson et al, and even further in view of U.S. Patent No. 4,362,271 to Montmory, and still even further in view of U.S. Patent No. 3,568,925 to Lietzer

The rejections of claims 1, 11 and 20 above address the techniques referred to by the Applicant as “triggering”, “fattening”, “attacking” and “enhancing” and will not be replicated here. As per claim 13, the technique of relocating a cloud, referred to by the Applicant as “moving”, is taught tangentially by Lietzer, as Lietzer shows the formation of a cloud “enhanced” to make rain, and moved via prevailing winds to a desired location, the cloud lifting as it is moved. By combining the desired result of Lietzer with the it would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined the known weather modifying techniques and teachings of Dennis, Rottner et al, Nelson et al and Montmory in order to promote the initiation of a desired weather event in a desired location

. As per claim 14, the dispersion of fog (i.e. a low cloud) is taught by Nelson et al using flakes of hygroscopic chemicals (Col. 1, line 9-17), where fog evaporation equates to a cloud being raised, or reduced in its lower elevations, in the broadest reasonable interpretation, and therefore moved. Calcium chloride is named as a known exothermic hygroscopic chemical used for this purpose (Col. 2, line 30-34). As vapor pressure reduces, and heavier drops affected by the hygroscopic chemical fall, the fog becomes buoyant, and therefore rises. A prevailing wind, well known in the art and inherent in nature, as demonstrated by Leitzer would then reasonably apply a moving force in a direction of the winds and therefore move the cloud.

Regarding claim 16, in which the use of "fattening" step as demonstrated by Nelson et al and further by utilizing the combined teachings (Dennis, Montmory, Nelson et al) and of "Attacking" would cultivate a phenomenon if used at the windward side of a mountain where an upwind rainfall could possibly occur, making the claimed device unpatentable due to the described methodology already cited and does not result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES S. HOGAN whose telephone number is (571)272-4902. The examiner can normally be reached on Mon-Fri, 6:00a-3:00p EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Len Tran can be reached on (571)272-1184. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Art Unit: 3752

/J. S. H./
Examiner, Art Unit 3752
04/06/10

/Len Tran/
Supervisory Patent Examiner, Art Unit 3752